**Abstract**

**Background:** Endodontic procedures such as root canal treatment would be at the risk of failure like other medical interventions due to any unsuitable conditions. In this regard, applying low-efficiency techniques can cause several negative consequences such as errors in length, cleaning, shaping, and the quality of obturation. The aim of this study is to determine the iatrogenic errors and the quality of root canal treatments on mandibular premolars in Ardabil population by the aid of CBCT images in 2018.

**Methods:** This cross-sectional retrospective study was carried out using the archive of Dr. Basser Radiology Center in 2018. Axial, coronal, and sagittal sections of CBCT images were observed for detecting missing canals, perforations, ledges, vertical root fractures and also the quality of endodontic filling. The observation process was done by an endodontist, a radiologist, and a dentistry student. The data collected from this study were analyzed using SPSS software version 20 and the descriptive statistical method (frequency and percentage) was used for reporting the results.

**Results:** The results showed that the most common error was underfilling in second and first mandibular premolar (9.5% compared with 9.2%), respectively. Overfilling and missing canal are the second and third common errors in this study (6.3% and 3.9%). ledge, perforation and vertical root fracture in the second premolar were the least common failures (0.26%). However, perforation and vertical root fracture were Not found in the first mandibular premolars. It was observed that missing canals occur in three types; i.e., Lingual, Mesial, and Buccal. All the missing canals of the first mandibular premolar were lingual. In comparison, in the second premolar, 71.4% of missing canals were lingual and the rest were Mesial or Buccal (each of them was 14.3%).

**Conclusion:** The results of the present study showed that the most common mistakes were errors in length and missing canals, So more education toward working length determination techniques, using electric apex locator, more knowledge about anatomy variation and using CBCT in doubtful case is recommended.

**Keywords:** CBCT, Iatrogenic errors, Mandibular Premolars